UNITED STATES
TELEPHONE
ASSOCIATION

EX PARTE OR LATE FILED

July 22, 1996

William F. Caton
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

RE: Ex Parte Notice, CC Docket No. 96-98

Dear Mr. Caton:

On July 19, 1996, United States Telephone Association representatives met with John Nakahata, of Chairman Hundt's office. The USTA group consisted of the undersigned, Ed Young (Bell Atlantic), Bob Blau (BellSouth), Alan Ciamporcero (Pac Tel), and Jerry Hausman (MIT).

The topic of the meeting centered around the points discussed in Attachment A, Comments on DOJ's TSLRIC Pricing Analysis, and Attachment B, Interlata Usage Charts. An original and one copy of this ex parte notice are being filed. Please include a copy of this notice in the public record of these proceedings.

Respectfully submitted,

Keith Townsend
Director
Regulatory Affairs & Counsel

Attachments
cc: John Nakahata
Ed Young
Bob Blau
Alan Ciamporcero
Jerry Hausman

Comments on DOJ's TSLRIC Pricing Analysis

By Jerry A. Hausman[1] - July 11, 1996

1. In these comments I discuss how DOJ's approach to TSLRIC fails to account for fundamental features of telecommunications networks, including sunk costs and lumpy investment (i.e. investment made in large, discrete blocks rather than continually over time). I demonstrate that DOJ's approach also ignores technological progress, decreasing equipment prices, and uncertainty. All of these economic factors are extremely important when investments are sunk and expected lives of networks are long. Contrary to DOJ's assertion, a competitive firm in this economic situation which sets its price according to TSLRIC, as advocated by DOJ, would lose money and go out of business.

2. I then review DOJ's estimates of consumer gains from its recommended policy. DOJ's estimates disregard economic reality because they assume that ILECs are currently earning supra-normal profits, which no one has shown. DOJ's estimates also assume that basic, local, residential service does not receive a subsidy from other services, which is contrary to almost universally accepted calculations for ILECs.[2] The DOJ cost estimates are not based on sound economics. They are based on the Hatfield Model, whose conclusions and methodology DOJ acknowledges it has never evaluated (p. A3 n.7). That model assumes a new telecommunications network built on a "green field" basis and ignores the reality of the current network. As a result, the DOJ calculations do not reflect consumer gains from more efficient telecommunications prices; instead, they reflect an assumed monetary transfer from ILEC shareholders to consumers. But this transfer will not occur in the real world; it is a figment of DOJ's mistaken economic assumptions.

I. DOJ's Adoption of the "Green Field" Approach to TSLRIC

3. DOJ adopts the principle that the calculation of TSLRIC should exclude "overinvestment" and should focus on the "efficient provider" standard (p. 10). But lumpy investment is not "overinvestment," contrary to what DOJ and the big IXCs have contended. By adopting the "efficient provider" standard, DOJ

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[1] MacDonald Professor of Economics, M.I.T.

[2] See, e.g., Robert W. Crandall and Leonard Waverman, Talk is Cheap (1996) p.78 & n. 7.

never recognizes the sunk nature of investments in telecommunications networks. And by not recognizing the effect of sunk costs, DOJ misunderstands how competition works in an industry with lumpy investment and technological progress.[3] Application of the DOJ approach would cause a competitive firm to lose money on all of its investments. The unfortunate firm would soon go out of business.

A. Lumpy Investment and Overinvestment

4. Economists have recognized for decades that in many industries "lumpy investment" is the cost minimizing strategy. Indeed, an optimal strategy in many industries takes the form of setting an upper and lower bound on capacity utilization. For instance, if expected growth will cause capacity utilization next year to be above X% (say 90%) the rule is to do enough new investment so that capacity utilization will be at Y% (say 60%). The upper and lower bounds, X% and Y%, depend on many economic factors including the fixed cost of investment, the rate of technological progress, variation in demand, and economies of scale. The local telephone network presents an extreme situation where the distribution plant is sized so that no plant additions are expected to be required because of the extremely high cost of expansion.[4] Switches are also a lumpy investment, although they can be increased in size over the life of the switch.

5. At any given point in time, say July 1, 1996, a hypothetical network could be designed with no excess capacity. The cost of this network, which DOJ advocates as the correct cost standard, will be less than that of any real world network that serves the same amount of demand. But the DOJ network will not be the economically efficient network for July 2, 1996 or July 1, 1997 or any other date. As soon as demand grows, the trenches will have to be opened to expand transmission lines, the switches will need new line cards and other expansion items, and other costs of expansion will have to be undertaken. Thus, what DOJ claims is overinvestment is instead the cost minimizing approach to network expansion given the lumpiness of investment

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[3] DOJ's omission of a consideration of sunk costs is especially surprising given the emphasis on sunk costs in the DOJ and FTC Merger Guidelines (April 2, 1996), "Firms considering entry that requires significant sunk costs must evaluate the profitability of the entry on the basis of long term participation in the market, because the underlying assets will be committed to the market until they are economically depreciated." (¶ 3.0)

[4] However, even these plans do not always work out. For example, unexpected increased demand caused by home computers has required additional investment recently

in local telephone networks.[5]

B. Sunk Investment with Technological Progress

6. The "green field" approach advocated by DOJ is especially poor economic analysis in the presence of sunk costs and technological progress. Consider the following example where a competitive firm sets prices according to the TSLRIC standard put forward by DOJ. A new company, DOJ Telcom, decides to enter the Internet access business. The company buys a switch (router) which costs $10,000. It expects to serve 100 customers each year with variable costs of $500 per year. The firm's cost of capital is 10% and it expects to use the router for 5 years at which time the resale (scrap) value of the router will be zero.[6] The discounted cost of the project over 5 years is $11,895, which is the TSLRIC. On a per customer basis the cost is $118.95 so that if the price were set at $31.38 per year the net present value (NPV) of the project is zero. Thus, DOJ's advice to the Commission would be to set the price at TSLRIC, or $31.38 per year. Unfortunately, the company will lose money at this price and so the investment will never be made. I now explain the two reasons for this conclusion.

7. First, the price of routers, switches, fiber optic electronics, and other telecommunications equipment is decreasing with technological progress. I will assume that the price of the router declines by $1000 each year, but all other costs remain the same. For a market entrant in year 2, the TSLRIC calculation would lead to a discounted cost of $10,895 (exactly $1000 less if no further price reductions occurred) so that the TSLRIC set price will be $28.74 per year. Now the initial entrant, DOJ Telcom, will be forced to decrease its price by $2.64 and it will lose money on each customer (taking the cost of capital into account). Indeed, DOJ Telcom can expect to lose $760 on the project in that year. The story will continue the next year when the router price falls to, say, $8000. Thus, TSLRIC prices causes the initial entrant to lose money even in a world

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[5] I am not claiming that no network engineer ever made a mistake or that actual growth is not sometimes less that expected growth due to unexpected economic downturns. However, ILECs have no economic incentive to overinvest in their networks given the incentive type of regulation adopted by the FCC and the majority of the state PUCs.

[6] The terminal value assumption can be changed with no change in the conclusions to the analysis.

of complete certainty. Instead of charging $31.38 for each year as TSLRIC implies, DOJ Telcom must charge decreasing prices over the 5-year horizon of $36.65, $33.75, $30.85, $27.95, and $25.04, due to competition. Where did DOJ Telcom go wrong?

8. For sunk investments, it has been known in the economics literature since at least 1963 that the change in the price of the equipment needs to be included in the cost of capital.[7] However, TSLRIC does not include this factor. Instead, TSLRIC assumes a monopoly situation where no new entry can force down price and where regulators can base prices on historical cost as they did for decades using rate of return regulation. Thus, it is incorrect that TSLRIC leads to competitive market prices. TSLRIC is designed for monopoly regulation, not for the competition in the presence of technological progress. For DOJ Telcom, the competitive price would not be the TSLRIC answer of $31.38. Rather, DOJ Telcom must charge $36.65 the first year and then decrease its price to $33.75 the next year, and so on, because of the decreased price of the router.[8] Thus, the TSLRIC price is too low by about 17% for the first year because it ignores the falling price of capital goods.

C. Sunk Investment with Uncertainty

9. My example assumed complete certainty. However, uncertainty over future economic events must also be considered. The DOJ Telcom Internet service could face competition in the future from cable TV-based Internet services and from wireless-based Internet services. If this new entry occurs, the price of Internet services is likely to decrease. Since DOJ Telcom's investment is sunk, when it lowers its price it will not recover its investment. Thus, DOJ Telcom will lose money. Good luck could strike and increase demand for Internet services. However, price is unlikely to increase because new entry or expansion by existing companies will at best keep price near its original level. Thus, uncertainty will create an additional risk premium which will need to be included in the original investment decision. Competition with the current technology places a

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[7] See D. Jorgenson, "Capital Theory and Investment Behavior," American Economic Review, 53:247-259, 1963.

[8] This decreasing price over time with technological progress is observed in the semiconductor industry, e.g. microprocessors, and many other industries.

ceiling on the price and cuts off the "upside potential" of the investment, but new technologies with lower costs and prices will create "downside potential" which must be paid for. The premium due to uncertainty is substantial for long-lived sunk investments, as I discussed in my previous statement.[9]

10. Thus, DOJ in its TSLRIC recommendation has ignored both technological progress and the effect of uncertainty, two economic factors that are very important in analyzing the future of telecommunications. DOJ has also ignored yet another factor. In competitive markets, unexpected shifts in demand can lead to higher prices for a given period of time before new entry occurs. However, regulation eliminates these possible upward price movements and so lowers the expected value of an investment relative to the competitive situation.[10] If price regulation continues for any of the services offered by ILECs, DOJ has further biased the results against the ILECs by assuming the absence of regulation. DOJ's recommendation is similar to forcing pharmaceutical company shareholders to finance new drug R&D where the shareholders bear all losses for unsuccessful projects, but if a successful new drug is found the price can only be set to achieve a "normal" rate of return on that individual project. Investment in the pharmaceutical industry would quickly decline in this type of regulated situation.

II. DOJ Ignores Current Price Regulation of ILECs

11. DOJ ignores two facts which are almost universally agreed to by economists: (1) ILECs are closely regulated and no economic study has shown that FCC and state regulation have allowed ILECs to earn supra-normal (monopoly) profits, and (2) residential service is priced below any relevant measure of cost, including TSLRIC. Taking these two economic factors together, some ILEC services must be priced above costs or the ILEC will run a deficit. The realities of current telecom regulation cannot be assumed away.

A. Current Regulation Sets Some Service Prices Below Cost So That Other Service Prices Must Be Set Above Cost to Permit a Normal Return

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[9] Note that this uncertainty premium is calculated for a risk neutral firm.

[10] The DOJ discussion of competitive markets (p. 20) with uncertainty fails to note that regulated markets differ because regulation removes the upside potential by placing an upper limit on prices.

12. DOJ recommends that no restrictions on regulatory arbitrage by resellers should be permitted. (pp. 23-31) Thus, the DOJ proposal would allow businesses that are required to use measured rate service to buy below-cost, flat-rate residential service. Indeed, a business customer could hook up a PBX to flat rate lines and send about 6 times the average business traffic over a residential line. Economists are not in favor of below-cost residential service. But regulators have created this situation. Allowing regulatory arbitrage ignores this regulatory reality. DOJ's recommendation asks the FCC to impose a substantial loss on ILEC shareowners, rather than correctly recommending that regulatory subsidies first be eliminated, before arbitrage restrictions are eliminated.

13. Currently, interstate access rates are well above cost in order to help cover the joint and common costs of the network, and to support local residential rates that are generally below cost. According to my analysis, the correct way to move access prices closer to LRIC is to increase the residential SLC.[11] Good economic efficiency reasons exist for this change, and almost all the economists at the FCC forum on May 20, 1996 agreed that the SLC should be increased and access prices decreased. But DOJ does not call for regulatory reform; instead, it states that no restrictions should be permitted on access arbitrage (pp. 24-25). DOJ fails to note that access revenues are at least 30% of the ILECs' net revenues, so that elimination of these revenues without replacement would create a significant economic problem for ILECs.

14. DOJ is implying that the FCC has not done its job. For ILEC revenues to decrease by 30% with no economic or financial problem implies that the FCC has permitted ILECs to earn supra-normal profits currently. Otherwise, such a change would not satisfy the Telecommunication Act of 1996 that the ILECs recover their "reasonable costs", let alone earn a "reasonable profit". DOJ has not shown that ILECs have earned supra-normal profits which should be decreased by changes in regulation. To the contrary, there is no evidence that ILECs have earned anything above normal, risk-adjusted returns, which is the usual economist's test for the exercise of market power.[12] Regulatory distortions should be removed, but changes must be

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[11] See J. Hausman, "Proliferation of Networks in Telecommunications", in W. Sichel and D. Alexander, Networks, Infrastructure, and the New Task for Regulation, (University of Michigan Press, 1995).

[12] This is the proper test where data exist to do the calculations.

balanced by raising other prices to cost. DOJ instead again endorses a "green field" approach for services currently priced above cost and takes no account of how current regulatory policy forces ILECs to offer other services below cost.

B. DOJ's Estimates for Residential Consumers Defy Economic Reality

15. DOJ estimates that its recommendation will benefit consumers by $12 billion, or more, annually. (p. 31, p. A3) DOJ makes a fundamental economic error in its estimation procedure. It bases its cost estimate on the Hatfield model, but the Hatfield model does not describe any real telephone network. The Hatfield model attempts to estimate costs for a hypothetical, new, local telecommunications network.[13] However, ILEC costs, including forward looking costs (LRIC or TSLRIC), depend on existing networks. For example, Hatfield estimates that a "green field" network can provide a loop at $8.26 per month while Pacific Bell, for example, estimates its LRIC to be $15.07 per month.[14] DOJ never analyzes whether the Hatfield loop cost estimates are close to reality; it just accepts them. If Hatfield were correct an economist would expect Hatfield's clients AT&T and MCI, to begin construction of their own networks. Instead, AT&T has announced it plans mainly to resell ILEC services. Market actions speak much more clearly than simulation models, especially when the models are constructed for advocacy purposes.

16. DOJ also claims that both intrastate and interstate toll service prices would fall, leading to a savings of $12 billion per year, without any change in the current level of basic local service for residential customers. This statement also defies economic reality. IntraLATA toll and interLATA access are both priced above cost to provide contribution (subsidy) for coverage of various joint and common network costs and for below-cost, local, residential service. However, DOJ's calculation comes to the incredible conclusion that basic residential service receives almost no current subsidy based on a TSLRIC calculation from the Hatfield

[13] The Hatfield model assumes an unrealistically high capacity utilization figure and assumes that the network is put into place instantaneously which unrealistically biases cost estimates downwards. But networks are not put into place instantaneously; they grow over time.

[14] Hatfield Model, May 30, 1996 version. Pacific Bell submission to CPUC, California Universal Service Subsidy Proceeding, 1996.

model (DOJ Reply Comments, p. A-5) This estimate is inconsistent with almost all estimates that I am aware of and certainly with what regulators believe. If DOJ were correct, ILECs should be earning supra-normal profits, which they are not.

17. DOJ then assumes that access would decrease to incremental cost, causing both intrastate and interstate long distance prices to decrease. These estimates are incorrect for two reasons. First, they assume that long distance prices decrease with no corresponding increase in local rates. Thus, DOJ rejects the common belief that residential local service receives a subsidy which I discussed above. DOJ's second mistake is to assume that there are no joint and common costs between local service and long distance access. To the contrary, the common costs are quite large since the same switches, central offices, and feeder plant are used to provide both local service and long distance access. DOJ has recognized previously that joint and common costs exist, but DOJ doesn't include them in its current estimate. With competition a competitive firm must still cover its joint and common costs or it will not survive.

18. Unfortunately, DOJ does just the wrong calculation. Consumer welfare would increase with regulatory reform which (1) increases the SLC, i.e. the price of basic local service, and (2) reduces long distance access. The reason for the welfare gain is because the price elasticity of local access is very near zero (-.005) while the price elasticity of long distance is significantly higher.[15] Indeed, I have calculated the gains in consumer welfare and economic efficiency from this kind of regulatory reform.[16] Thus, more efficient pricing of telephone services does lead to a gain to consumers of over $1 billion per year. But, DOJ is not evaluating more efficient pricing of telephone services in their estimate. DOJ is merely assuming a transfer of surplus from ILECs to consumers. But this transfer will not occur in the real world because there is no such surplus to be transferred. DOJ's conclusion that this transfer would be driven by competition is the product of its mistaken economic analysis.

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[15] See J. Hausman, et. al., "The Effect of the Breakup of AT&T on Local Telephone Penetration", American Economic Review, 1993 for the elasticity estimates.

[16] See J. Hausman, "Proliferation of Networks in Telecommunications", op. cit.

Interlata Usage: Company B											
Usage Decile	Number of Accounts	Total Lines		Intrastate Calls		Intrastate Minutes		Interstate Calls		Interstate Minutes	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
1	690	901	5.34%	553	0.33%	544	0.14%	1478	0.25%	1182	0.10%
2	683	966	5.73%	1158	0.69%	1962	0.51%	4154	0.71%	5135	0.42%
3	683	1139	6.75%	2558	1.52%	4838	1.26%	7546	1.30%	10435	0.86%
4	683	1265	7.50%	3858	2.29%	7595	1.98%	12219	2.10%	18754	1.54%
5	683	1404	8.33%	4935	2.93%	10833	2.83%	19617	3.37%	31292	2.57%
6	683	1523	9.03%	8097	4.80%	18625	4.87%	27747	4.76%	47380	3.89%
7	683	1747	10.36%	11428	6.78%	26694	6.98%	39446	6.77%	73018	6.00%
8	683	1965	11.65%	18996	11.26%	42535	11.12%	59068	10.14%	113682	9.34%
9	683	2343	13.90%	31271	18.54%	75041	19.61%	103017	17.69%	202897	16.68%
10	683	3609	21.40%	85805	50.87%	193977	50.69%	308168	52.91%	712749	58.59%
Total	6837	16862	100.00%	168659	100.00%	382644	100.00%	582460	100.00%	1216522	100.00%

Interlata Usage: Company A											
Usage	Number of	Total Lines		Intrastate Calls		Intrastate Minutes		Interstate Calls		Interstate Minutes	
Decile	Accounts	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
1	1363	2849	2.79%	1289	0.16%	1478	0.08%	2484	0.06%	2428	0.03%
2	1360	2662	2.61%	3688	0.47%	5861	0.30%	6650	0.17%	10852	0.11%
3	1360	2795	2.74%	6274	0.79%	12623	0.65%	13702	0.35%	26064	0.27%
4	1360	3577	3.50%	12391	1.57%	25780	1.34%	26532	0.69%	45837	0.48%
5	1360	4123	4.04%	19714	2.49%	43243	2.24%	39167	1.01%	77482	0.81%
6	1360	4349	4.26%	31389	3.97%	70133	3.63%	64967	1.68%	127778	1.34%
7	1360	6637	6.50%	51527	6.52%	123440	6.40%	101430	2.63%	208848	2.19%
8	1360	7750	7.59%	87599	11.08%	212732	11.03%	178023	4.61%	391364	4.10%
9	1360	15778	15.44%	153214	19.38%	378597	19.62%	426708	11.05%	967066	10.14%
10	1360	51655	50.56%	423334	53.56%	1055632	54.71%	3003148	77.75%	7676952	80.52%
Total	13603	102175	100.00%	790419	100.00%	1929519	100.00%	3862811	100.00%	9534671	100.00%